

REMARKS

I. Status of the Claims

Claims 16-30 are currently pending in this application.

II. Rejections Under 35 U.S.C. § 103(a)

(A) The Examiner has maintained the rejection of claims 16-30 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,707,732 (Sonoda et al.) in view of U.S. Patent No. 6,262,151 B1 (Betso et al.) for the reasons disclosed on page 2 of the Final Office Action. Applicants respectfully traverse this rejection for at least the reasons previously presented and for the additional reasons set forth below.¹

Applicants' invention is not obvious over Sonoda et al. in view of Betso et al. To establish a *prima facie* case of obviousness, the Examiner must show that three basic criteria have been met. See M.P.E.P. § 2143. Applicants submit that the Examiner has not and cannot show, at a minimum, that the prior art references teach or suggest all of the claim limitations, and that there is motivation in the references or in the knowledge generally available to one of ordinary skill in the art to combine the references in order to recreate Applicants' claimed invention. See M.P.E.P. §§ 2143.01 and 2143.03.

1. The References do not Teach the Hydrolysable Organic Silane Limitation

Applicants submit that Sonoda et al. does not expressly or inherently disclose the limitation: "hydrolyzable organic silane groups grafted onto the polymer chain for compatibilization of the natural magnesium hydroxide with the polymeric components,"

¹ While not addressed here in full, Applicants maintain their position that the cited prior art does not teach or provide the motivation to use natural magnesium hydroxide.

as presently claimed. This is supported by the evidence of record, including the attached Declaration of Redondo.²

Sonoda et al. discloses an electrical cable comprising a core surrounded by a composition comprising a mixture of resins and a flame retardant compound. Col 1, lines 47-55. Sonoda et al. further discloses that some of the resin mixtures, i.e., copolymers may be modified with an unsaturated aliphatic diacid anhydride, such as maleic anhydride, through grafting. Col. 1, line 56-col., line 3. This is a well known procedure to achieving compatibilization with flame retardant fillers. See Redondo Declaration, paragraph 8.

In contrast with Sonoda et al., the present claims recite the use of hydrolysable organic silanes as the filler compatibilizer. In fact, Applicants have shown through test data that hydrolysable organic silanes are superior filler compatibilizers as compared to unsaturated anhydrides, such as maleic anhydride, because they create “an optimum balance of mechanical properties.” See Specification at Table 2, p.27.

Applicants agree that Sonoda et al. also teaches making the copolymers hydrolysable by optionally grafting a copolymer with a hydrolyzable organic silane group. Under the disclosed conditions, Sonoda et al.’s grafting process, however, serves a wholly different function versus the claimed compatibilization. Sonoda et al.’s disclosure to optionally graft a copolymer with an alkenyl trialkoxy silane in the presence of an organic peroxide is an express disclosure of moisture curing (*i.e.*, cross-linking of

² Mr. Redondo has extensive experience in the field of electrical cable compositions and in particular the thermoplastic polymers thereof, which are the polymer types at issue in the present rejections. Declaration of Redondo, paragraphs 2-5.

the copolymer). See col. 6, lines 41-56; see *also*, Redondo Declaration, paragraph 8. It is well understood that cross-linking a copolymer is not the same as compatibilization of a filler with a polymeric component. See *e.g.*, *Betso* at col. 10, lines 42-58.

In response, the Examiner has asserted that “[t]here is no evidence on this record that the silane groups of Sonoda do not compatibilize the polymer with the magnesium hydroxide” and that “this teaching [of moisture curing] does not preclude some silane groups from compatibilizing. . . .” Final Office Action at 5. Applicants respectfully disagree. Both the documentary evidence of record and the Redondo Declaration challenge this assertion.

As an initial point, Applicants note that the burden is not on Applicants to show that compatibilization would not occur. Rather, it is the Examiner’s burden to provide factual and technical grounds establishing that the claimed feature necessarily flows from the teachings of the prior art. See *Ex Parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990). The Office must cite facts in support of a Section 103 rejection and not the Office’s opinion. *In re Zurko*, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) (“With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or expertise Rather, the Board must point to some concrete evidence in the record in support of these findings.”).

In this case, Sonoda et al. only discloses grafting a copolymer with an alkenyl trialkoxy silane under conditions for the purpose of cross-linking the copolymer and no other purpose. Col. 6, lines 41-56. As evidenced by the Redondo declaration, a person of ordinary skill in the art would recognize that Sonoda et al. discloses the ingredients

and conditions for the well-known practice of using an unsaturated aliphatic diacid anhydride to compatibilize filler and polymeric components. See Redondo Declaration, paragraph 8. A person of ordinary skill in the art would also recognize that Sonoda et al.'s use of an alkenyl trialkoxy silane under the conditions disclosed will result in moisture curing. *Id.*

The use of both the anhydride and silane, however, in the manner taught by Sonoda et al., should not result in compatibilization of the filler and polymeric components by the silane, which is required by the present claims. *Id.* The Examiner has not offered any evidence that this compatibilization process is likely to occur or that there is a motivation to modify the conditions of Sonoda et al. to promote such compatibilization. It is well-established that the reference must direct those skilled in the art to the presently claimed invention **without any need for picking, choosing, and combining various disclosures** within the reference not directly related to each other by the teachings of the cited reference. *In re Luvisi*, 144 U.S.P.Q. 646, 649-50 (C.C.P.A. 1965).

Moreover, contrary to the Examiner's suggestion, Betso et al. does not establish that compatibilization **will** occur. Betso et al. teaches that when a coupler and/or initiator is present, that different forms of coupling **may** occur. See col. 10, lines 38-39. Thus, compatibilization of particle and polymer, by definition, cannot be an inherent property of the silanes's presence; it is only one of several possible outcomes, depending upon the conditions. Col. 10, lines 40-58. Betso et al. expressly states that whether or not cross-linking, compatibilization, or some other coupling occurs is a

function of (1) amount of ingredients, (2) types of ingredients, and (3) conditions to which ingredients are subjected. Col. 10, lines 59-61.

As the Applicants had pointed out in their September 10, 2003 Response, inherency “may not be established by **probabilities or possibilities**. The mere fact that a certain thing **may** result from a given set of circumstances is not sufficient.” See M.P.E.P. § 2112 (citing In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). Thus, for Betso et al. to be evidence of record that establishes inherency, compatibilization must **necessarily** occur when the anhydride is present. See M.P.E.P. § 2112 (citing In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993)). Yet, Betso et al. merely establishes a possibility.

In addition, the record is replete with evidence that one of ordinary skill in the art **would not** expect the silane groups of Sonoda et al. to compatibilize.

First, the prior art teaches that a person of ordinary skill in the art expects anhydrides, such as those of Sonoda et al., to compatibilize, *i.e.*, provide resins with an affinity with flame-retardant fillers, such as magnesium hydroxide, in order to increase the filler acceptability of polymers. *Dupont Industrial Polymers: Fusabond®*, <http://www.dupont.com/industrial-polymers/fusabond/H-81624/H-81624.html> (previously provided).

Second, as noted in Applicants’ specification, and supported by the Redondo Declaration, at paragraph 9, Sonoda et al.’s anhydrides are more reactive than the organic silanes. Specification at 6, lines 27-30. Accordingly, one of ordinary skill in the art would expect Sonoda et al.’s anhydrides to compatibilize the filler particles and the polymer, before the silanes.

Third, although the Office correctly points out that Sonoda et al. teaches grafting the copolymer with a hydrolyzable organic silane group, Sonoda et al. only teaches a person of ordinary skill the conditions wherein the result is entirely different from compatibilization between a polymer and a flame retardant filler. Rather, Sonoda et al. expressly teaches conditions wherein its copolymers are made hydrolyzable for the purpose of moisture curing, in the presence of a silanol condensation catalyst. See col. 6, lines 41-59. A person of ordinary skill in the art would recognize Sonoda et al.'s moisture curing as a well-known technique to **crosslink polymers** and **not** a technique to **couple filler particles** with the polymer. Redondo Declaration, at paragraph 9. Once again, Applicants direct the Examiner's attention to an article previously presented to the Examiner: A Review of Fifteen Years Development in Moisture Curable Copolymers and a Future Outlook, http://www.borealisgroup.com/public/pdf/customercentre/WC_Mumbai2002_Visico.pdf (discloses that Sonoda et al.'s process at col. 6, lines 28-56 is well-known to create crosslinking in copolymers not bonds between particles and polymers)(previously provided).

Fourth, a person of ordinary skill in the art reading Sonoda et al. in view of Betso et al. would not expect compatibilization. As discussed above, Betso et al. explains that cross-linking versus compatibilization versus some other coupling mechanism is a function of (1) amount of ingredients, (2) types of ingredients, and (3) conditions to which ingredients are subjected. Col. 10, lines 59-61. Sonoda et al. only teaches the conditions under which the anhydride would compatibilize and the silane would cross-link. In view of Betso et al.'s explanation of the criticality of ingredients and conditions, a person of ordinary skill in the art would not expect the environment described in Sonoda

et al. to promote compatibilization by the silanes, as required by the pending claims.

See Redondo Declaration, at paragraph 9.

Applicants further submit that a person of ordinary skill in the art would not be motivated to modify the teachings of Sonoda et al. to obtain compatibilization by the grafted silanes. While Betso et al. does disclose that under some unspecified conditions that this result may be achieved, that is not enough. Col. 12, lines 30-33. First, Betso et al. fails to provide the person of ordinary skill in the art with the conditions to achieve this desired result. Second, a person of ordinary skill in the art would not be motivated to do so, since the anhydrides already do the job.

**2. The References do not Teach
the No Appreciable Cross-linking Limitation**

Sonoda et al. details how once the polymer has been made hydrolysable, they are **moisture cured** (*i.e.*, cross-linked) in the presence of a silanol condensation catalyst. See col. 6, lines 41-59. Accordingly, Sonoda et al. does not recognize the limitation of “no appreciable cross-linking,” and, in fact, teaches away from that limitation when organosilanes are present. Therefore, Sonoda et al. does not expressly or inherently teach all the limitations of the claims.

In the Final Office Action, the Examiner asserted that the claimed limitation of “no appreciable cross-linking” does not exclude “some degree of cross-linking”, because Applicants did not specify the degree of cross-linking or gel content. Final Office action, at 6. Applicants respectfully disagree.

The claims recite that there is “no appreciable cross-linking.” “Appreciable” is a term of degree that means “capable of being perceived or measured.” See MERRIAM-

WEBSTER'S COLLEGIATE DICTIONARY 57 (10th ed. 1993) (previously provided). As discussed in detail above, Sonoda et al. discloses methods of cross-linking copolymers, including the amount of cross-linking agents and the temperatures **necessary** to achieve cross-linking. Col. 6, lines 28-56. Therefore, Sonoda et al. expressly teaches a perceivable, and measurable, amount of cross-linking of its copolymers.

For the foregoing reasons, Sonoda et al. in view of Betso et al. do not expressly or inherently teach all the limitations of the claims, or provide the necessary motivation to modify the teachings to achieve those limitations. Thus, the references fail to render the claims obvious and the present rejection should be withdrawn.

(B) The Examiner has rejected claims 16-30 under 35 U.S.C. § 103(a) as being unpatentable over Sonoda et al. as applied above to claims 16-30, in view of U.S. Patent No. 5,139,875 ("Metzemacher et al."), for the reasons given at pages 5-6 of the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below

In the Final Office Action, the Examiner stated that Matzemacher et al. is relied upon only to show that "it is known in the art to use natural magnesium hydroxide as a flame-retardant filler." Final Office Action at 8. Applicants do not agree with the Examiner's position that one of ordinary skill in the art would use natural magnesium hydroxide in the composition of Sonoda et al. However, since the Examiner has not addressed Applicants' position that Metzemacher et al. does not cure the deficiencies in Sonoda et al., *i.e.*, Sonoda et al. does not teach the "hydrolysable organic silane" and "no appreciable cross-linking" limitations, Applicants respectfully submit that this

rejection should be withdrawn for the same reasons presented above and incorporated by reference herein.

III. Conclusion

In view of the foregoing remarks, Applicants submit that this claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants

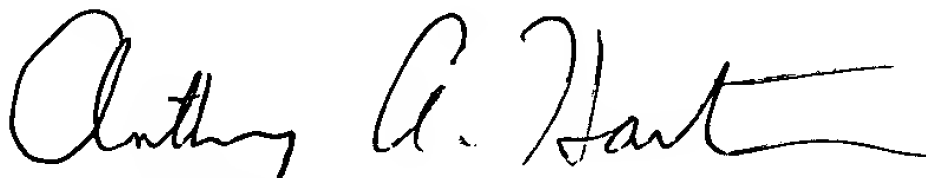
therefore request the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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GARRETT & DUNNER, L.L.P.

Dated: January 31, 2005

By: 
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Attachment: Declaration Under 37 C.F.R. § 1.132 of E.G. Redondo